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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/687,034  | 10/16/2003  | Pengfei Ma           | 02-283              | 9103             |
| 719   | 7590        | 07/11/2005           | EXAMINER            |                  |
| CATERPILLAR INC.<br>100 N.E. ADAMS STREET<br>PATENT DEPT.<br>PEORIA, IL 616296490 |             |                      | HANAN, DEVIN J      |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 3745                |                  |

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

Application No.

10/687,034

Applicant(s)

MA, PENGFEI

Examiner

Devin Hanan

Art Unit

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/16/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/16/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments and amendments filed 2/16/05 have been fully considered, but they are not persuasive.

Applicant argues that the reference Morishita (U.S. Patent 5,513,551) does not teach of using a sinusoidal signal to dissipate energy (pages 6-7, lines 14-2). Additionally, the applicant argues that Morishita does not disclose a sinusoidal signal (page 7, lines 3-4). Further arguments state that varying flow rates through oil lines does not involve dissipating energy (page 7, lines 7-15). The final argument against the Morishita reference, standing by itself, is that oscillating is not taught by the reference (pages 7-8, lines 16-2).

The combination of references, Morishita (U.S. Patent 5,513,551) and Deaton et al. (U.S. Patent 6,433,991) is called into question because the references do not teach each and every element, offer any motivation to combine, and have a reasonable expectation of success when combined.

In response to the arguments that Morishita does not teach of moving the directional control member to dissipate energy, the examiner highlights col. 7, lines 37-44. This processed can be otherwise described as the valve opening to start the movement of the swing bracket, closing the valve to stop the bracket, opening the valve to relieve pressure (claimed to be an "instant", but the valve was still open), thus taking pressure off of the seals in the cylinder (dissipating energy) and finally closing the valve

to keep the swing bracket in the desired position. This open, close, open and close pattern is the equivalent of oscillating, and includes the dissipation of energy. The simple moving of a swing bracket does not constitute dissipating energy, but when the bracket is to be stopped (and in the example of a swing bracket it needs to be stopped at certain positions), dissipation of energy will be necessary.

While it is clear that Morishita has a control signal controlling the valve (col. 4 lines 15-20), it is unclear from the Morishita reference whether or not the control signal is sinusoidal. As stated in the previous paragraph it is clear that flow energy is dissipated from the lines. Morishita does disclose that the control current may be a square function or other function (col. 5 lines 31-32) and this control current controls the amount of operation of the valve (col. 5 lines 51-53). Morishita does not expressly disclose the control current is sinusoidal, however, Deaton et al. teaches of a sinusoidal control current.

In response to the argument that the references do not cover all of the elements, offer motivation to combine, and give reasonable expectation of success, the examiner cites Morishita figure 3. The figure shows a position sensor for detecting a magnitude parameter (26), a speed detector indicative of the change rate of a said swing command (27a), an operating signal output as part of an electronic control module (27) to send a signal to the directional flow control device (27c), a directional fluid flow device (19) and hydraulic cylinders of a work machine (9,10).

With regards to the teaching of the sinusoidal signal, Deaton et al. teaches of sinusoidal signal that involves "cycling activation energy between on and off states" (col.

3, lines 23-24) which is capable of controlling an electromagnetic proportional control valve as found in the Morishita reference. Morishita already teaches of dissipating energy, as described in the above paragraph, through the use of a square wave or other function (col. 5 lines 31-32). Deaton et al. teaches of a square wave being equivalent to a sinusoidal signal (col. 4 lines 23-26). It would have been obvious to one of ordinary skill in the art that electronic control modules can be used to make many different waveforms, including square waves and sinusoidal waves.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Morishita (U.S. Patent 5,513,551).

Regarding claim 9, Morishita discloses a method for dissipating energy in a swing cushion system of a work machine, the system including a directional flow device (19) having a directional control member (19), and a control device (27) coupled to said directional flow device (19), comprising the steps of:

producing a stop swing command (figure 9, S11);  
generating a signal indicative of variable pre-determined parameters (figure 5);  
dissipating energy in said swing cushion system using said signal (figure 5).

oscillating said directional control member to dissipate energy in said swing cushion system in response to said signal (col. 7 lines 37-44).

Regarding claim 8, Morishita discloses the step of sending said signal to said directional flow device (column 4 lines 21-28).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6 and 10-11 are rejected under U.S.C. 103(a) as being unpatentable over Morishita in view of Deaton et al. (U.S. Patent 6,433,991).

Morishita discloses a swing cushion system of a work machine, comprising:  
a directional fluid flow device (19) having a directional control member (19);  
a control device (27) coupled to said directional fluid flow device (19);

and

wherein said control device (27) outputs a signal to said directional fluid flow device (19) to shift said directional control member (19) to dissipate energy in the fluid (col. 7 lines 37-44).

Regarding claims 3 and 4, Morishita discloses of using at least one variable pre-determined parameter of: a time parameter, a magnitude parameter, and a frequency parameter (column 1 lines 54-55).

Regarding claim 5, Morishita discloses the control device is a programmable electronic control module (27).

Regarding claim 6, Morishita discloses using a signal that has at least one variable pre-determined parameter, said at least one variable pre-determined parameter (figure 7) is of a magnitude parameter, and said programmable electronic control module includes an algorithm (figure 8,9) for calculating said at least one variable pre-determined parameter.

Regarding claim 10, Morishita discloses a method for dissipating energy in a swing cushion system of a work machine, the system including a directional flow device (19) having a directional control member (19), and a control device (27) coupled to said directional flow device (19), comprising the steps of:

- producing a stop swing command (figure 9, S11);
- generating a signal indicative of variable pre-determined parameters (figure 5);
- dissipating energy in said swing cushion system using said signal (col. 7 lines 37-44), with the signal including steps of:

- providing a variable predetermined parameter indicative of the position of the directional control member (26 col. 4 lines 8-9);

- providing a variable pre-determined parameter indicative of a change rate of said swing command (col. 4 lines 10-11); and

producing a signal indicative a change rate (col. 4 lines 12-14).

Regarding claim 11, Morishita discloses the step of sending the signal to the directional control device (col. 4 lines 20-28).

Morishita as applied to claims 1 and 10 above teaches all of the above claimed elements with the exception that they do not teach of the signal being a sinusoidal signal.

However, Deaton et al. teaches of the use of a sinusoidal signal to control a directional control device (column 4 lines 24-25), with the sinusoidal signal being equivalent to a square wave signal.

Since Morishita and Deaton et al. are from the same field of endeavor, controlling electromagnetic devices with electrical energy, the alternate waveform (sinusoidal as opposed to square) would have been recognized in the pertinent art of Morishita. It would have been obvious to one of ordinary skill in the art at the time the invention was made to signal the directional control devices of Morishita using sinusoidal signals as taught to be equivalent in the Deaton et al. reference.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the



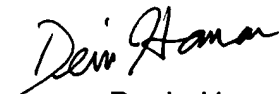
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devin Hanan whose telephone number is 571-272-6089. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on 571-272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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6/22/05